reAction

user manual

Dudek Paragliding ul. Szancera 2/XIp 85-792 Bydgoszcz tel. +48 52 348 55 35 info@dudek.com.pl

DUDEK paragliding

www.dudek.com.pl

NOTE!
Please read this operating manual before the first flight

IMPORTANT:

Remember to fill in and send us the registration card, which is sewn on to the trailing edge of the paraglider. When we receive it, we will send you the Warranty or AeroCasco confirmation (whichever you choose).
The confirmation will allow us later to identify the paraglider, to categorise it in its proper insurance group and to determine the insurance expiry date.
Also, the confirmation is useful, when you want to sell the paraglider (it allows the new owner to keep all the benefits).

NOTE! If you aren't the first owner of the paraglider, you should send us the registration confirmation together with a copy of previous users' logbooks (total of flying hours) within 14 days from the date of purchase, in order to be able to keep the warranty.

CONTENTS Page

1. Introduction.....3
2. On the wing.....4
2.1 Design
2.2 Construction
3. Flight operation.....9
3.1 Steering lines and speed system adjustment.....9
3.2 Free flying.....9
3.2.1 Take-off
3.2.2 Flight
3.2.3 Landing
3.2.4 Winching
3.3 Powered flight.....12
3.3.1 Take-off
3.3.2 Level flight
3.3.3 Landing
3.3.4 Golden rules!
3.4 Quick height loos.....19
3.4.1 Big ears
3.4.2 Spiral dive
3.4.3 B-stal
3.5 Acro Flying.....21
3.5.1 Wing over
3.6 Extreme manoeuvres.....21
3.6.1 One sided collapse
3.6.2 Frontal collapse
3.6.3 Full stall and negative spin
3.6.4 Parachutal stall
3.6.5 Line over and cravatte
3.6.6 Steering in extreme situations
4. Canopy care.....23
4.1 Storage
4.2 Cleaning
4.3 Repair
4.4 Deterioration - a few tips
5. Technical data.....25
6. Three Star Security Assistance.....26
7. What have you bought.....29
8. Rigging tables.....31
9. Risers.....34

1. INTRODUCTION

CONGRATULATIONS!
We are pleased to welcome you among the number of discerning Dudek Paragliding pilots. You are now the proud owner of a state-of-the-art paraglider. Extensive development by using the most modern methods and thorough testing make the Dudek ReAction a user-friendly paraglider without neglecting performance and fun of flying.

We wish you many enjoyable years flying your new Dudek ReAction.

DISCLAIMER.

Please read this Manual carefully and note the following details:

The purpose of this Manual is to offer guidelines to the pilot using the Dudek ReAction **wing and it is by no means intended to be used as a training manual for this or any other paraglider in general.**

You may only fly a paraglider when qualified to do so or when undergoing training at an accredited School or with an Instructor.

Pilots are responsible for their own safety and their paraglider's airworthiness.

The use of this paraglider is solely at the user's own risk! The manufacturer and distributor do not accept any liability.

This paraglider on delivery meets all the requirements of the CEN/AFNOR. Any alterations to the paraglider will render its certification invalid.

NOTICE

Dudek Paragliding warns that due to the constant process of development the actual paraglider may differ slightly from the one described in the manual.

2. ON THE WING

WHO SHOULD FLY REACTION**?**

You have already tried paramotoring and you know that it is your game. Relaxed sightseeing is not enough for you - you like to see your name on the winners' roster :) You want to explore new realms, fly in difficult terrain and conditions. You are not afraid of thermal flying. You like flying to the limit (full throttle + full speedbar). And as you really do not want any compromises and need the best wing in the world, the wing used by most of the top-placed sportsmen . . .

Then there's no choice, is there. There's nothing better than ReAction. With it you will really let off steam . . .

2.1 DESIGN

While working on the ReAction we put so much effort into the glider's safety, good handling, performance and simplicity of everyday use, that it will satisfy a broad range of pilots. In recent years we have been closely watching the career of our former PPG wing (Action - a paraglider that caused a worldwide transformation of PPG sport flying). We monitored its performance and talked to the pilots, obtaining a lot of knowledge that went into improving both the concept and its realisation.

We succeeded and the ReAction is an even better wing than its famed predecessor.

A good PPG wing must be a very stable and tuck-resistant craft. When this is achieved, the user does not have to concentrate all the time on piloting, saving energy and attention for navigation, taking pictures or simply enjoying the flight. In addition the faster and safer your paraglider is, the more time can you spend in the air.

While the ReAction was designed to retain all the features of a conventional paralider with a sporty touch, the application of a reflex aerofoil section added several new qualities. First of all, using that profile means that the wing stability does not depend exclusively on the pilot's weight and actions. It maintains its own pitch attitude, rising and falling through thermals while remaining stable above your head, without need for so much pilot input.

Generally speaking the reflex profile is a special kind of aerofoil section. The specific static pressure distribution creates a situation where, at low attack angles, only the wing fore part (some 60% of the chord) is producing lift, while the rear 40% of the chord creates an effective stabiliser against excessive decrease of the attack angle.

The trimmer system allows you to raise the rear part of the airfoil, effectively reducing projected chord and surface area by some 30%, thus giving the paraglider a higher wing loading and increased speed without change in the angle of attack. The centre of pressure also moves forward, adding enhanced pitch stability. Such a shift of loading gives the wing exceptional tuck-resistance and increases the projected aspect ratio, resulting in faster and more efficient flight when at speed.

Should you require more lift at lower speeds, the rear section can be pulled down to restore a full airfoil, effective along the whole chord.

Piloting the ReAction actually is more reminiscent of flying a conventional powered aircraft than a paraglider.

Below we will try to give you a closer look at some of the remarkable ReAction features.

2.2 CONSTRUCTION

The ReAction has a slim, elliptical planform with slightly rearward swept tips. Its triple cells ensure a smooth top surface, exact aerofoil reproduction across the entire wingspan, and yet more importantly, fewer suspension points. Consequently the number of lines used and their overall length has been greatly reduced, thus reducing the parasitic drag too. All that, particularly at high speeds, makes for an exceptional glide angle.

Inside the wing on its lower surface there are reinforcements between certain line groups, and at the D row there is a special band added to stabilise movements of the canopy . Those reinforcements are made of a special, strong fabric. Four extra cells at each wingtip form stabilisers which ensure stable straight flight and effective and co-ordinated turns. There are also special openings at the very tips for easy removal of the dirt that possibly may gather there.

The aerofoil for the ReAction was prepared basing on experience we learned with previous designs, then the model was optimised and tested with specialised software. It is a self-stabilising, reflex wing section as described above.

The leading edge is closed, and its correct shape is maintained with laminated reinforcements. The cell openings are located on the undersurface near the leading edge. Their exact position was carefully adjusted so in practically all flight conditions the point of highest ram effect remains in that area. In some places they are closed, thus adding more energy to the airflow under the leading edge and creating extra wing stiffeners (the cells involved are less likely to lose air pressure). We have verified that those closures do not decrease the air pressure inside the canopy, as that would be a seriously prejudice safety.

The areas of the suspension points are reinforced with a laminated fabric, and the load is distributed uniformly in three planes: vertical (with suspended ribs), oblique (with slanted ribs) and horizontal (with lateral reinforcements on the undersurface). Adequately shaped and situated intercellurar openings guarantee efficient distribution of air pressure and fast inflation of the canopy. These openings are scaled up or down together with the ribs, so that in no configuration do they disturb the wing section.

Thanks to careful selection of modern materials and design concepts the ReAction is pretty tough. All fabrics used come from numbered batches, and each production step can be verified (with identification of the responsible worker and supervisor).

THE FABRIC

Each textile has its own characteristics, so the materials must be properly matched in order to create a paraglider that behaves harmoniously. For the upper surface of ReAction we have used the Porcher fabric, named Skytex 45 Evolution (formerly named Aquatic), perfectly proven in our wings. Basically it's a nylon material covered with superb E85A impregnate, introduced into mass production in January 2002 after a series of extensive laboratory and real flying tests. Such covered fabric is not very stiff and - what's most important - has increased tear, stretch and UV resistance. It is not silicon, so minor repairs can be easily made with self-adhesive strips.

The lower surface is made of Skytex 40 Classic with E38A impregnate. This fabric has a great weight/resistance ratio and is one of the greatest Porcher successes in providing proper materials for the paragliding industry.

The ribs must be as rigid and stretch-resistant as possible. We found these qualities in Skytex 40 Hard with E29A impregnate.

All reinforcements are made of SR-Scrim (polyester scrim laminated on a polyester film).

RIGGING SYSTEM

All of the ReAction suspension lines are sheathed by a coloured polyester layer which is covering brownish Technora core. Such composition makes for high strength and stretch-resistance of the lines.

The rigging system consists of individual lines looped and stitched at each end. The main lines are made of Technora and depending on their location have 1.8 mm, 1.5 mm, 1.3 mm or 1.2 mm diameters. Such diversity stems from different loads on the lines groups concerned. The lines of the middle and upper layers are made of 1.2 or 1.3 mm Technora.
The only exception is the Sport version of the wing, that is built with non-

sheathed Dyneema Ultimate of 0.8 mm lines in the top layer of lines (gallery).

The upper level lines (gallery) start at the attachment points. Every two lines join one middle layer line. These in turn connect by twos or threes to the main suspension lines, which are attached to the risers with triangular quick links (maillons). To prevent their slipping off, the lines are kept together with a rubber 'O ring'. All the maillons are made of corrosion resistant, polished stainless steel, ensuring excellent strength and durability.

The brake lines run from the trailing edge through consecutive cascades to the main steering lines, which are lead through pulleys connected to the rear risers and end at the brake handles.

The steering lines do not carry any load until the brakes are applied. Steering lines of the AT group are additionally led through rings sewn into the trailing edge. Because of this feature the trailing edge is shortened on application of the brake, so that steering becomes lighter and more effective.

All the lines are distinguished with colours depending on their strength and diameter as follows:

diameter: 2.3 mm; strength: 420 daN; colour: celadon (willow green),
diameter: 1.8 mm; strength: 280 daN; colour: red and orange (the latter for pulling big ears),
diameter: 1.5 mm; strength: 190 daN; colour: violet,
diameter: 1.3 mm; strength: 140 daN; colour: green,
diameter: 1.2 mm; strength: 90 daN; colour: blue,
for the 'S' version: diameter: 0.8 mm; strength: 87 daN; colour: red ,

(given colours are subject to slight changes).

THE RISERS

For the ReAction we have chosen four-way risers equipped with:

speed-system affecting A, B and C risers when engaged;

trimmers with coloured band, designed for quick and easy replacement in case of deterioration;

two levels of the pulleys, to be used depending on the hangpoint.

For quick and easy recognition in emergency, some of the risers are distinguished with coloured band as follows:

A - golden (used for launching)
B - red (used for B-stall)
D - grey (needed to keep the glider down in strong winds or interrupting the launch).

The main A suspension line connects to an A riser (gold), B and stabiliser lines go to B riser (red), C lines (black) go to C riser, and D lines to D riser (grey), which through pulleys keep the steering lines too.The brake handles are attached to the steering lines at optimal places, guaranteeing safe and effective operation. On the main brake lines there are two points marked, higher and lower, to be used depending on the harness hangpoint. On adjusting the steering lines see chapter 3.1.

For the ReAction paraglider we have reworked our standard brake handles. Beside more robust construction they feature a DCT and Easy Keeper systems.

Double Comfort Toggle

DCT: in order to satisfy different needs of our clients we have created a Double Comfort Toggle system. With this solution it is possible to have your brake handles in stiff or soft configuration, with no need to buy another set of toggles and replace them every time. All you have to do now is take out the stiffening rod and there you are - the soft handle is ready to use.

Easy Keeper

Easy Keeper is the name of our new indigenous way to hold the brake handles at the risers. The strong neodymium magnets keep them firmly in place, while both attaching and releasing goes smoothly and easily. This idea was developed especially for the PPG-dedicated paragliders, for there is often a need to take your hands off the brakes to check or fix things. With Easy keeper you can easily secure the brakes in flight, thus minimizing danger of their contact with the propeller.

3. FLIGHT OPERATION

3.1 STEERING LINES AND SPEED SYSTEM ADJUSTMENT

We strongly advise the following actions to be made with support of an instructor or at least an experienced pilot.

A brand-new ReAction has its steering lines set for powered flight in high hangpoint configuration.

The risers of the ReAction are shorter than in most paragliders, so the differences in hangpoints are somewhat smaller. There are still two sets of pulleys prepared, higher and lower (see risers scheme on page 34). Also on the main steering lines there are two spots marked for the brake handles to be accordingly fixed.

When flying with lower hangpoints (or free-flying) the brake lines are to be run through the higher pulleys only, and the brake handles should be positioned at higher marks, thus shortening the brakes in general. The rule is simple - the higher hangpoints require longer brake lines, the lower hangpoints - require shorter lines.

Before you take your ReAction on powered flight, we advise to try out everything first. Hang up the entire PPG unit with ropes or lines, sit in the harness and have someone pull up the risers. You must be sure that in flight you will always be able to reach the brake handles, even if the airflow blows them away.

Whike you are suspended in this way, it is a perfect opportunity to adjust the speed system as well. The speedbar should not pull its lines (and risers) when it is not applied, neither should it be too loose, for then it could catch the propeller.

An additional way to check the whole configuration is to visit the take-off site in steady winds. With the engine off, fill the wing and take it up over your head. When it stabilises, check that the brakes are loose and do not pull the trailing edge. There should be a spare inch or so before they activate. Remember that it is always safer to set the margin of play too big than too small. And, most important, the setting must always be symmetrical.

3.2 FREE FLYING (no power aboard)

Although the ReAction according to its design book is a fast wing for powered flight, it behaves surprisingly well as a classic paraglider too and can be used as such without any changes. You have to remember though, that greater trim speed results in greater sink too, in comparison with dedicated free-flight wings.

The main difference between ReAction and other paragliders means that, due to its increased tuck-resistance (during both start and flight) and greater speed range you, can safely fly it in strong conditions. Generally (and paradoxically) speaking, the faster you fly, the safer the flight is.

3.2.1 TAKE-OFF

In the case of the **classic launch** we recommend that after laying out the wing all lines be taut. Then the ReAction is pulled up with the A risers only. The optimal trim setting is 30% (counting from the fully closed position). With steady pressure on the A risers, move forward. The wing practically does not overshoot, so the front collapses, which otherwise happen often, occur very rarely on the ReAction. Instead it kind of waits for you to catch up with it.

In the case of the **reverse launch** we also recommended the 30% trim. Due to lack of the tendency to overshoot, take-off is easy, the pilot only has to brake slightly. The reverse launches can be executed without any problems even in weak wind (1.5 m/s).

CAUTION

During take-off it is important to keep the risers under pressure until almost airborne. The reflex profile used has an inherent tendency to increase the angle of attack. In effect, the ReAction can lag behind the pilot when not pulled appropriately.

3.2.2 FLIGHT

The increased speed range of ReAction may demand some attention. Nevertheless, once you have mastered these additional aspects, flying will become pure pleasure. Good handling will let you make the best use of thermals, and increased speed on glides means that your presence in sinking air will be shorter. To avoid stalls when braking with trims closed, their movement is restricted. When the trims are fully opened the wing becomes faster and stiffer, increasing its stability even more. The brake forces increase too, as well as the distance to the stall point. The radius and banking angle in turns grow proportionately to the growing brake forces.

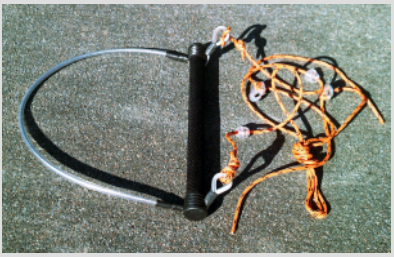
Speed system use

The full application of the speed system increases the flight speed by some 30%. In contrast to most paragliders it does not decrease wing stability, in fact it seems to counter the turbulence even better. Still, if you encounter serious trouble, it is advisable to decrease speed. Also with the application of the speed system the brake forces increase, so it is better to use it mainly on straight glides. At maximum speed and fully opened trims we recommend steering the wing with the outer B lines (the wingtip one) by catching it above

the quicklink and pulling down. Turns executed in this way will be wide, but without decrease in speed.

The speed system can be safely used at all trimmer settings.

Easy Catch speedbar



"Easy Catch" is a godsend for all those who have problems catching the bar after starting. Here the speedbar is designed to stay always in front of the speedsystem lines, so it is always handy (or footy :o).

Its finish is very robust, so long-term service is guaranteed.

3.2.3 LANDING

ReAction has a reasonable glide angle, so the landing approach must be well planned. The brake forces, initially low, grow proportionally, giving ample warning before stalling. Still the characteristics of stall are somewhat different from those of most wings, so you should be careful at low speeds until fully familiar with brake operation.

With closed trimmers the ReAction lands like any other paraglider, with considerable speed on approach, levelling out and gradually exchanging speed for lift. Landing with open trims may require proportionately more space, as the paraglider has a lot of kinetic energy and careless application of the brakes may even cause the wing to climb. All said, we have to stress that generally the brakes are pretty effective and with their last inches the wing can be literally stopped.

Most pilots get to know the wing relatively fast and quickly gain enough trust to fly it in stronger conditions than they did ever before. Still, you should always be especially careful when flying low. Remember that ReAction flies faster than most paragliders and sometimes it can be of importance (e.g. when landing on a slope).

After landing in strong wind the paraglider can be safely put down with the B risers, or with a strong pull on the rear D risers.

3.2.4 WINCHING

ReAction is not designed for winching. As mentioned before, the reflex profile used has an inherent tendency to increasie the angle of attack. While in normal flight such a disposition makes it safer, during winch starting it can be dangerous.

Nevertheless, we have made a lot of successful winches on ReAction. Experience shows that it should only be done with fully open trims.
To sum it up: winching can be done, but proper attention must be paid.

3.3 POWERED FLIGHT

CAUTION: Before each start it is necessary to run a thorough check of the wing, harness and power unit.

In powered flight most of the wing characteristics remain as described above (chapter 3.2). Still there is additional information needed, concerning power output, proper matching of the wing/engine/propeller association etc. Dudek Paragliding cannot take responsibility for all possible combinations, but if you contact us we are always ready to help.

First flights

In order to get familiar with your wing we recommend flying with closed trimmers at first, because the ReAction behaves in the same configuration as a standard wing. Try pulling the brakes until you feel resistance, usually it will be at about 1/4 of the range.

Once you feel competent with your wing, you can start experimenting with opening the trimmers and using the speed system. Learn to use all the additional speed and safety of the ReAction.

3.3.1 TAKE OFF

Classic launch with no wind

Even when it seems that there is no wind at all, it is rarely so. Therefore always be careful in determining the conditions, as because in PPG flying it is most important that the launch and initial climb are performed with a head wind (the danger of losing your airspeed while crossing the wind gradient is greatly reduced). Special attention must be paid to trees, power lines and other obstacles, including the possibility of emerging rotors.

Wing preparation

Lay out the paraglider downwind of the power unit, with all suspension lines taut and pointing toward the power unit centre. The risers are to be laid on the ground. Set the trimmers at 30% (see fig. 2). In strong conditions faster

settings can be advised. Make sure that you warm up the engine while standing windward of the wing. Stop the engine before clipping in the risers. Now have a quick check that:

the helmet is on and locked,

the risers are clipped in the carabiners,

the trimmers are set,

nothing will get in propeller's way,

speed system is running without problems,

steering lines and handles are free and not twisted,

engine delivering full power,

airspace is clear for take off.

Then, before the actual launch, check that the engine runs at full power and that the launch space is free. The launch itself should be executed as described above (chapter 3.1).

From now on you should steer the paraglider facing only into the wind, without looking back over your shoulder (when the wing is low behind you, turning can cause some lines to get in the propeller). Also, possibly falling on your back and the propeller is dangerous (and costly!) so this should be avoided at any price, even that of some damaged lines!

During the launch when you feel that the strain on both risers is equal, open up full power and lean back to counter the engine thrust, so that it can push you forward rather than to the ground.

The best option is not to use the brakes, and to allow the wing to rise as it was laid out. If it starts to swerve from its course, just pull the opposite riser and run under the centre of the wing while keeping to the right starting direction.

If the wind suddenly weakens, give a stronger pull on the risers.

If the paraglider drops to one side or back too far to be lifted again, switch off the engine, interrupt the launch and check the conditions once again. As the wing rises, the forces grow lighter and it should stabilise above your head without overshooting. This is the best moment to see that it is inflated well and the lines are not tangled, but do it without stopping or turning. If you feel the forces on the risers decrease, run faster and let go of the risers. See whether there is any opposition on the brakes and, if necessary, use them to correct direction or to take off.

CAUTION:

If the cage of your power unit is not stiff enough, the risers strained

during launch can deform it to the extent of collision with the propeller. Before giving it full power, check that the cage does not catch any lines.

Any brake operation (or steering inputs in general) should be smooth and gentle.

Do not try to take off until you have your wing overhead. Hitting the power before that can cause dangerous oscillations.

Do not sit in the harness until you are sure you are flying!

The faster the trim setting is, the more brake input is required to take off.

The lower the hangpoints of your power unit are, the easier is the launch.

Reverse launch in strong wind

Reverse launch can be executed holding both A risers and one brake in one hand, throttle and the second brake in the other hand. With a decent wind it is by far the best way. In weaker wind it is better to prepare a classic launch, as running backwards with an engine on the back is not an easy thing to do.

It is reasonable not to pull the wing up until you are really determined to launch, especially when it is clipped in. Lay down the rolled paraglider with the leading edge facing the wind.

Unfold the wing enough to find the risers and check that no lines are looped over the leading edge. Stretch the risers against the wind, separating the left and right sides.

We suggest that at this moment you should already turn the risers in the same way as you would be turning during a reverse launch, and place one riser over the other, with the rear risers upmost. It should be done this way because, once you clip in, the cage of your power unit will make turning on your own impossible.

Run the pre-launch checklist. After warming up the engine put the power unit on, turn to face the wing, go to the risers and clip them in the appropriate carabiners.

Pulling on the front and rear risers open the cells. It is a good idea to pull up the wing briefly in order to check that the lines are not tangled.

Holding the risers, brakes and throttle as described above, pull the front risers and raise the paraglider over your head. On most occasions you will not have to brake it, especially if the trimmers are set for fast flight. Perhaps it does not agree with our experience, but this is the way the reflex profile

works. When the trimmers are fully off, the profile stabilises the wing and does not allow it to surge forward. It can even stay back a little - in such case pull the brakes a little and the glider will - paradoxically - come forward.

Once you have it overhead, you can turn around, open the throttle and take off. As with the classic launch, in this case too you have to find the combination of trimmers, brakes and throttle settings that will give you the best speed and rate of climb.

CAUTION:

You are launching with your hands crossed. You have to really master this technique before trying it with a running engine on your back.

Any brake operation (or steering inputs in general) should be smooth and gentle.

Do not try to take off until you have your wing overhead. Hitting the power before that can cause dangerous oscillations.

Do not sit in the harness until you are sure you are flying!

The faster the trim setting is, the more brake input is required to take off.

When clipping in the crossed risers, you can find the proper connection of the speed system particularly hard. Be careful not to confuse one riser or another.

Climbing

Once you take off safely, continue heading against the wind, using the brakes to correct the rate of climb. Do not try to climb too steeply - due to its greater speed in comparison to conventional paragliders, ReAction's flight path is flatter. Attempts to make it steeper by pulling the brakes will have an adverse effect - due to the additional drag the rate of climb will worsen, and even with the throttle fully open a stall can happen.

In powered flight the ReAction behaves more like an aeroplane than a paraglider, and it is good idea to think about it in this way. If there are no obstacles present, it is by far safer (and more impressive for the spectators, too) to fly level for a while after take-off and gain some speed before converting it to height with a brief pull on the brakes.

Another reason not to try climbing too steeply is the risk connected with engine failure at low altitude. Although the ReAction in a steep climb does not stay back so much as conventional paragliders do, the low speed is more likely to cause a stall. Besides, you should always be able to land safely in case of engine malfunction, so it’s better not to take unnecessary risks, and better to fly with a safe margin of speed.

Depending on the power unit geometry, once in the air you may encounter

serious torque effect. It will try to provoke a turn, so be ready to counter it with appropriate brake or cross bracing. Still, if such a situation happens during the climb with 'slow' trimmers and full power, be aware of the risk of stall.

Due to typical PPG feature - considerable vertical distance between thrust axis and wing chord - the range of safe power operation is closely connected with your skills and equipment.

Power-unit induced oscillations

Certain configurations of engine weight, output and propeller diameter can cause serious oscillations, during which the pilot is lifted to one side by the torque effect, swings down due to his weight, then is lifted again and so on.

To avoid this you can:

change the throttle setting and/or

adjust the cross bracing to counteract the torque, if there is one present and/or

shift yourself to the other side of the harness and/or

change the trimmer setting.

The best method is to fasten the opposite cross-bracing, or weight-shifting. Such oscillations usually occur at full power - the greater the engine output and propeller diameter, the bigger the swings. In addition there are often too late or wrong pilot reactions, that complicate the problem instead of solving it (especially the less-experienced pilots often tend to overreact, which ends in so-called pilot-induced oscillations). In any case the safest way to deal with this question is to close the throttle and release the brakes.

3.3.2 LEVEL FLIGHT

Once you have gained safe height after take-off and wish to go for a route, you can turn onto the right direction, fully open the trimmers and let off the brakes. If the conditions are turbulent it can look foolhardy, but it is the feature of the reflex profile - the faster you fly, the safer your ReAction is. That's why you can really confidently release the brakes and enjoy your flight.

CAUTION: Some pilots with previous free-flying experience may have a well-grounded habit of keeping the brakes slightly applied all the time. Such a technique, while quite reasonable on a free-flying wings as it allows for quick pilot reactions and lessened sinking, is not advisable on a reflex-profile wings. When you pull the brakes, the ReAction profile loses its self-stabilizing features.

If you have a vario- or altimeter, do observe it. In level flight it is very easy to start climbing unintentionally. The instruments will help you optimise speed and fuel economy. Of course each flight will depend on the current configuration of your gear but, thanks to its ability to fly safely without constant piloting, the ReAction will let you adjust everything to the best effect. Good knowledge of the weather conditions (e.g. wind at different altitudes) and intelligent use of thermals, convergence and other kinds of lift will help you greatly reduce fuel consumption and increase the flight range. The engine is there to help you find advantageous situations, but it is your task to use it. Do not hesitate to lead the ReAction into tight thermalling, and you will be surprised how efficient it is. Possible shortening of the trimmers will make the climb ratio even better.

Trimmers and speed-system operation

The reflex wing section enables the ReAction pilot to use a wide range of trimmers and speed-system action. You are free to experiment with all possible settings, as long as you are on safe altitude.

Fully opened trimmers increase the speed and stability of the wing, and that means also its ability to cope with turbulences and overall penetration. As forces on the brakes grow at high speeds, the weightshifting or steering with outer B (stabilizer) lines becomes increasingly effective. Turns executed in this way are wide, but the speed will not decrease.

With slow trimmer settings there is an improvement in sink and steering forces diminish, so exploring the thermals becomes possible. Especially worth observing is the ReAction impressive speed range - the max speed is almost three times more than stall speed. Carefully study the drawings of trimmers and speed-system setting, as well as their influence on the wing shape.

Independent of the current wing configuration and speed the turns can be much tightened and more effective with differential brake operation. Slight use of the outer brake (with considerable amount of the inner one) will diminish the loss of lift during turn. The turns can be much improved by additional use of throttle, speed-system etc. Once with growing experience you will master these techniques, you will be able to execute fully co-ordinated and effective turns, that will bring to mind the aeroplane handling.

CAUTION:

Trimmer setting is another part of the pre-start check list!

If it will be asymmetric, the wing will be turning all the time. And if you will inadvertently set them off, the reflex profile of the ReAction will keep the wing level, so after opening the throttle you'll start to descend with increased speed instead of climbing.

3.3.3 LANDING

In PPG flying there are two kinds of landing: with and without power.

Power off landing

At an altitude of 50 metres switch the engine off and start gliding as on a conventional paraglider. It reduces the chances of damaging the propeller on landing, but on the other hand there is only one attempt possible - so it has to be done right!

With or without power ReAction copes with turbulence better on open trimmers. So, if the conditions are rough, it is better to make an approach with greater speed, plan a lot of space (as for a hangglider) and wear that speed off before touching down. ReAction preserves the energy very well, so there is a long float necessary to exchange the abundant speed for lift.

If the landing field is not big enough and you have to land on the spot, we advise you to shorten the trimmers by half or even completely close them. It will increase the lift coefficient of the wing, simultaneously decreasing the sink rate and speed. Such an action is most important when you are flying with a high surface loading.

Landing with power on

Make a flat approach with the engine idling, then level out and lose the speed before the final flare. Immediately after touchdown switch off the engine. The main advantage of this procedure is of course the possibility of a repeated approach in case of any misjudgement. Still, if you forget to switch off the ignition before the wing falls down, there is a considerable risk of damaging the propeller, catching lines in it or even injuries connected with falling on your running engine.

CAUTION:

Whenever possible, get to know the landing field before taking off

Check the wind direction before planning the approach

Landing with power off requires much less space

In case of any doubt, practice the landing until you feel totally safe

3.3.4 GOLDEN RULES!

Never place the power unit downwind of the paraglider, to avoid the mess caused by a possible sudden gust

Check, double check and then check once again that there is no fuel leakage

Do you have enough fuel for the flight? It is always better to have too much than too little!

Check if there is nothing loose in the harness, that could possibly contact the propeller in flight

Whenever you encounter a problem, fix it AT ONCE!

Always put on and lock the helmet before getting in the harness

Before each launch run a full pre-flight inspection

After landing, control the wing facing the direction of flight, as on turning you always risk getting the lines in the propeller. Turn only if there is danger of falling on your back

Do not ask for trouble - do not fly over water, between trees or power lines and other places where engine failure will leave you helpless

Remember turbulence caused by other gliders or even your own, especially when flying low

It is not reasonable to let go of the brakes below 100 metres, because a possible power unit malfunction may require immediate attention

In general never trust your engine, as it can stop at any moment. Always suspect that that is exactly what it's going to do

Unless it is not absolutely necessary (e.g. collision avoidance), do not execute tight turns against the torque direction. Especially in climb you can easily enter a stall and consequent negative spin

Do not fly at low altitude with a wind from behind, as it pretty much narrows your options!

Do not wait for the problem to grow, as any change of engine sound or a vibration can indicate some trouble, or even serious trouble - you'll never know until you land and check it out

Be certain of your navigation

Remember that not everyone is fond of your engine noise. Do not scare the animals

3.4 QUICK HEIGHT LOSS

3.4.1 BIG EARS

In order to get the big ears you have to pull down the outer lines of the A risers (usually distinguished with colour) by about 50 cm.

No matter whether you are pulling or just holding the big ears, you should

never let the brakes out of your hands. After tucking the tips in, ReAction will continue to fly straight with increased sink rate (up to 5 m/s). You can steer the wing pretty efficiently with weight-shifting.

After releasing the lines, the paraglider will usually open up on its own or you can assist it with a long stroke of the brakes.

For the sake of safety (the possibility of a parachutal stall) it is reasonable to engage the speed system after pulling big ears, in order to lessen the angle of attack of the wing centre. Executing the big ears with open trimmers is very difficult due to the reflex profile stabilisation.

CAUTION! (see the PARACHUTAL STALL chapter)

Never try to pull big ears during powered climb, as the increased drag can lead to an increase in the angle of attack and a parachutal stall. Besides, pulling the ears while climbing is pointless anyway.

3.4.2 SPIRAL DIVE

A spiral is characterised by reaching the highest sink rates possible. Significant G-forces, however, make it difficult to sustain a spiral dive for long, as it can place high loads on both pilot and glider. Never do this manoeuvre in turbulence or at too high bank angles. Control the dive and do not exceed 16 m/s sink. If the dive is not stopping after releasing the brake, assist the glider with the outer one.

NEVER DO BIG EARS IN A SPIRAL!

In this manoeuvre a smaller number of lines is carrying an excessive load mulitplied by the centrifugal force, what can lead to damage of the lines or even the paraglider itself (load of a single line can be much higher than checked in certification trials (i.e. 8 G).

3.4.3 B-STALL

To enter a B-stall, simultaneously pull down both B-risers (red) by 10 - 15 cm. The wing will collapse along B-row across the entire span, the airflow over the top surface will break and the canopy surface will be decreased. Forward movement will be almost completely stopped. Further pulling of the B-risers is not advised, as it increases wing instability. If the canopy forms a horseshoe with both wingtips in front of the pilot, gently apply the brakes to recover.

To exit a B-stall, the risers should be released in a smooth and decisive manner. On quick and symmetrical releasing B-lines the airflow will reinstate and the wing will surge forward, returning to normal flight. In contrast to other paragliders, in case of ReAction there is no need to counter this surge with brakes - yet another feature of the reflex profile!

CAUTION: see Parachutal Stall.

All rapid descent techniques should be practised in smooth air and only with sufficient height! Full stalls and spins are to be avoided as recovery procedures, since irrespective of paraglider type they may have dangerous consequences!

BY FAR THE BEST TECHNIQUE IS SAFE AND CORRECT FLYING, SO THAT YOU WILL NEVER NEED TO DESCEND RAPIDLY!

3.5 ACRO FLYING

ReAction is not designed to do any aerobatics.

3.5.1 WING OVER

You make a wingover by performing a series of consecutive, alternating turns with growing bank angle. Too much banking connected with some flaws in co-ordination and execution can evoke pretty dynamic collapse.

CAUTION:Steep turn with bank angle over 60 degrees is a prohibited aerobatic manoeuvre!

3.6 EXTREME FLYING MANOEUVRES

CAUTION: EXTREME FLYING MANOEUVRES SHOULD ONLY BE CARRIED OUT DURING SAFETY TRAINING COURSE (INSTABILITY TRAINING) UNDER PROPER GUIDANCE! WHILE PROVOKING OR EXITING REAL SITUATIONS THERE IS A DANGER THAT YOUR ACTIONS WILL PROVE TOO QUICK OR TOO STRONG, SO YOU SHOULD EMPLOY GOOD JUDGMENT, STAY CALM AND TAKE MEASURED ACTIONS.

Since all actions required to exit or prevent dangerous situations on ReAction are typical and pilots flying this wing should already have some experience, we are going to describe only the characteristic features of ReAction. A description of standard methods of dealing with extreme situations can be found in textbooks.

3.6.1 ONE SIDED COLLAPSE

Even when the trimmers are fully opened or the speed system is engaged, collapses practically do not occur and can be induced only by a very strong turbulence.

Still, if it happens, a little counter-steering is enough to keep the ReAction on course. In normal conditions ReAction will reinflate instantly and spontaneously.

3.6.2 FRONTAL COLLAPSE

The reflex profile of the ReAction makes it practically impossible, especially at higher speeds. During tests we succeeded in creating this situation only with closed trimmers. Such forced collapses were rather deep, so recovering required some pilot action (short and equal application of both brakes).

3.6.3 FULL STALL AND NEGATIVE SPIN

Practically do not occur, may happen only as a result of serious mistake or intentional action of the pilot. The stall characteristics are somewhat different than in most paragliders, so until fully familiar with the brake operation you should be careful when flying at low speeds.
Wing recovers spontaneously in initial phase of stall, otherwise use standard procedures.

3.6.4 PARACHUTAL STALL

Under normal conditions this does not occur. If you want to prevent it, stick to a couple of rules:

after B-stall, release the risers quickly and evenly. ReAction does not jump forward excessively;

after big ears execution, engage the speed system. This will increase the sink rate and safety margin, as big ears constitutes an aerodynamic brake with significant loss of speed.

Nevertheless, if such a situation happens, apply some pressure to the speed bar and/or push the A risers forward.

3.6.5 LINE OVER and CRAVATTE

ReAction is a modern wing which, in order to decrease drag, has fewer suspension lines and greater distance between them. Therefore it's always possible that after a tuck some stabiliser may tangle in the lines. Usually a couple of pulls with a brake settles the matter. If it's not enough, try to untangle it with big ears or a sharper pull on the risers.
In case of any doubts you should always consider throwing a rescue chute.

3.6.6 STEERING IN EXTREME SITUATIONS

In case of any malfunction, which renders normal steering impossible, you can safely steer and land using the D-risers (grey marking) or stabilo lines.

4. CANOPY CARE

Looking after your paraglider will prolong the life of your ReAction.

STORAGE.

Store the paraglider in a dry place away from chemicals and UV exposure.

Never pack or store the glider when wet. This shortens the life of the fabric. Remember that the wing becomes damp even while lying on green grass in full sunlight, as the grass transpires. A good precaution to avoid dampness and/or UV when you have to wait in a start queue is to use quick-pack after rigging up. Always dry the glider thoroughly before packing or storage. While drying, never expose your paraglider to direct sunlight.

To avoid excessive paraglider fabric wear, do not pack it too tightly.

Please note that frequent playing with your wing on a field or a small hill your paraglider will deteriorate more quickly due to its repeated rising, falling and being dragged around.

CLEANING

Clean the paraglider with water and a soft sponge. Do not use any chemicals or spirit, as these can permanently damage the fabric.

REPAIR

Repairs should only be carried out by the manufacturer, authorised distributor or authorised workshops. It is acceptable to fix minor cloth damage with the self-adhesive patches included in the package.

DETERIORATION: A FEW TIPS!

The Dudek ReAction is made mainly of nylon, a fabric which, like any synthetic material, deteriorates through excessive exposure to UV. Hence it is recommended to reduce UV exposure to a minimum by keeping the paraglider packed away when not in use. Even when packed in the bag, it should not remain in the sun for long.

The Dudek ReAction lines consist of Technora inner core and polyester sheath. Submitting them to excessive loads in flight should be avoided, as it can cause irreversible damage. Keep the paraglider clean, since getting dust in the lines and fabric will reduce their durability. Be careful to keep snow, sand or stones from entering the cell openings: their weight can slow or even stall the glider, and sharp edges can damage the cloth!

Prevent lines from catching anything, as they can overstretch or tear.

Do not step on the lines.

Uncontrolled strong wind takeoffs or landings can result in the leading edge of the canopy hitting the ground at high speeds, which may seriously damage the ribs and surface material.

Knots can chafe the suspension and/or brake lines.

Check line lengths after tree or water landings, as they can stretch or shrink. A line plan is included in this manual or may be obtained from the dealer when needed.

After landing in water you should check the wing fabric as well, since the wave forces can cause the fabric to distort in specific areas. When taking the wing out of the water, always do this by the trailing edge, so that water can flow out freely.

After a sea landing, rinse the paraglider with fresh water. Since salt crystals can weaken the suspension lines even after rinsing in fresh water, you should replace them with new ones immediately after contact with salt water.

Every second year ReAction should undergo inspection by the manufacturer or authorised distributor.

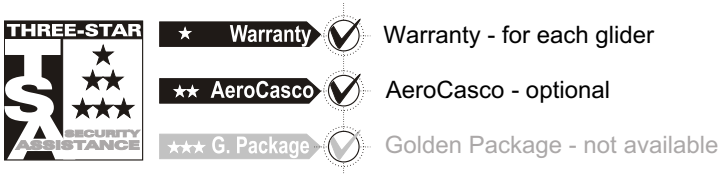
5. TECHNICAL DATA

ReAction	25	27	29	31
Certification CEN / AFNOR	Performance	Standard*	Standard*	Performance
Number of cells	65	65	65	65
Surface area (flat) [m^2]	25,77	27,81	29,80	31,92
Surface area (projected) [m^2]	22,82	24,63	26,39	28,27
Span (flat) [m]	11,83	12,29	12,72	13,17
Span (projected) [m]	9,82	10,20	10,56	10,93
Aspect Ratio (flat)	5,43			
Aspect Ratio (projected)	4,23			
Sink rate [m/s]	min = 1,1; trim = 1,5-2; max = 3,1			
Speed [km/h]	min = 23; trim = 42-46; max = 60			
Max. cord [cm]	267,00	277,00	287,00	297,00
Min. cord [cm]	50,00	52,00	54,00	56,00
Distance pilot to wing [cm]	748,00	777,00	804,00	832,00
Total line lenght [m]	407,00	423,00	439,00	455,00
Weight range [kg]	70-90	80-105	95-125	105-135
Weight [kg]	6,8	7,1	7,5	7,8
Lines	Technora: 1,2 & 1,3 & 1,5 & 1,8 & 2,3			
	ver. S Dyneema Ultimate: 0,8			
Fabric	top: SkyTex Aquatic 44 g/m^2 (E85A)			
	bottom: SkyTex New 39 g/m^2 soft (E38A)			
	ribs: SkyTex New 39 g/m^2 hard (E29A)			
	reinforcements: Mylar Polyester Scrim 180 g/m^2			
Risers	PASAMON - Bydgoszcz, Poland			

* AFNOR Standard with trim on (slow position), AFNOR Performance with trim off (fast position)

6. THREE-STAR SECURITY ASSISTANCE ★★★

We are aware of the fact, that a new paraglider purchase is a big expense for every pilot. That is why we are offering a security system that will allow you to insure your paraglider against any damage. We have introduced Three-star Security Assistance, which includes:



★ WARRANTY

Dudek Paragliding guarantees following free of charge repairs caused by the material or production flaws:

for the free-flying paragliders 3 years or 300 flight hours, depending on what comes first,
for the PPG paragliders 2 years/200 flight hours,
for the mountain wings (MPG), school or profit use it's 1.5 year/150 flight hours.

If the free-flying paraglider is used for powered flights, every hour spent in the air should be counted as two.

The warranty DOES NOT APPLY to any of the following:

canopy colour fading
damage caused by chemicals or salt water
damage caused by incorrect use
damage caused in emergency situations
damage resulting from accidents (airborne or otherwise)

The warranty IS ONLY VALID if:

flight is correctly registered in the logbook (incl. powered flight for free-flying paragliders)
the paraglider is handled in accordance with the operating manual
the purchaser has not carried out any repair by him/herself (excl. minor repairs with self-adhesive patches)
the purchaser has not carried out any modifications
the paraglider can be unmistakably identified
the purchaser can prove the total flying hours of the paraglider
the paraglider is inspected every second year
the purchaser can present the registration confirmation and the paraglider card

We will send you the registration confirmation as soon as we receive the registration card, which you will find sewn on to the trailing edge of your paraglider. You should remove it, fill it in legibly, sign it and send it by registered letter.

When you sell the paraglider, please hand over this confirmation to the new owner, together with a copy of your logbook (and previous owners' logbooks). Only by sending these documents to the manufacturer can the new owner maintain the warranty.

If you are not the first owner of the paraglider, you should send us the registration confirmation together with a copy of previous users' logbooks (total of flying hours) within 14 days from the date of purchase, in order to be able to maintain the warranty. After receiving the above mentioned documents, we will send you a new confirmation that will entitle you to all guaranteed repairs within the remaining warranty period. If the previous user did not keep any logbook, the warranty becomes null and void, as we are not able to check the paraglider's flying hours.

★★ AEROCASCO

Normal warranty does not cover any repair of damage caused by the user or a third party. As costs of such repair can be considerable, Dudek Paragliding offers an AeroCasco insurance. It covers a one-off repair of all mechanical damage, no matter how big, caused by the user or a third party.

The only expenses the purchaser has to pay are shipping costs and the share-of-cost amount. AeroCasco can be purchased with a brand new paraglider (within two weeks from the date of purchase) or within a year from the date of purchase, provided that the paraglider has been inspected by the manufacturer.

NOTE: In case of paragliders used by paragliding schools, the procedure of AeroCasco granting is different. Also, the extent of insurance and general conditions may be different.

AeroCasco applies only to damage caused during take-off, flight or landing. Obviously, any faults in the material or manufacturing flaws are covered by normal warranty.

In order to be able to receive the AeroCasco repair, the following REQUIREMENTS must be fulfilled:

When buying a new paraglider:

the purchaser must buy the AeroCasco insurance

the purchaser should send a correctly completed registration card (sewn on to the trailing edge) within 14 days from the date of purchase. After receiving the registration card we will send you AeroCasco confirmation, which must be presented when the paraglider is handed in for the repair. The confirmation is also necessary for a new owner to maintain the insurance.

When handing in the paraglider for the repair:

the purchaser should present this registration confirmation,

the paraglider's serial number should be identical with that on the registration confirmation,

the purchaser should pay a fee (as a share of cost).

AeroCasco is valid for one repair only.

There is a possibility of extending AeroCasco for one further year, if there has been no damage during the first year. AeroCasco can be extended, provided that the paraglider has been serviced by the manufacturer not later than one year after the date of purchase and the owner has paid the extension fee (according to the price list on the day of servicing). Remember to include the AeroCasco confirmation when you send the paraglider for servicing.

AeroCasco does not apply to any of the following: theft, colour fading, damage caused by incorrect storage or transport, damage caused by chemicals, salt water and *force majeure*.

★★★ GOLDEN PACKAGE

Golden Package is a combined sales offer of the most wanted gear and services on a fair price. In case of some paragliders, including ReAction, it is not available. For the details on Golden Package consult your dealer or our web page.

7. WHAT HAVE YOU BOUGHT

The Dudek paraglider that you bought should have the following items:

the paraglider itself with lines and risers

a speed system with Easy Catch

transport bag (with your wing inside it)

MotoBag - specialised double funcion backpack

a compression strap for tightening the wing before putting it into a bag

a windsock

a pocket with paper work and repair wallet including:

A piece of self-adhesive fabric (10 cm x 37.5 cm) for small repairs. Note that even small tears in the vicinity of a stitch have to be repaired by an authorised service.

A looped and stitched suspension line longer than the longest line used in the paraglider and has to be used only as a temporary replacement. Do not cut it if you have to replace a shorter line, just tie it at the length needed.

A paraglider passport with entered date of purchase and valid technical inspection (please check the serial number with the sticker on the wing tip).

The User Manual you are reading.

Remember to fill in and send us the registration card, which is sewn on to the trailing edge of the paraglider.

MotoBag

MotoBag is a dedicated solid backpack for PPG wings, made of proven Cordura fabric. Simultaneously it doubles as a quickpack if necessary. Beside comfortable shoulder straps to hold it traditionally on your back it has side handles too, so that you can carry it like a suit-case when needed. After turning it inside out it becomes a quickpack that will shelter your unfolded wing when you are in a hurry.

SUMMARY

If you respect the rules of safe flying and proper glider care, you will enjoy many years of pleasant airtime. Still, you must be aware of present dangers and face them wisely. You must accept the fact that all air sports are potentially dangerous and your actual safety depends solely on you.

We insist that you fly safely, and this concerns both the weather choice and safety margin during all manoeuvres.

FLYING THE PARAGLIDER IS ALWAYS YOUR OWN RESPONSIBILITY.

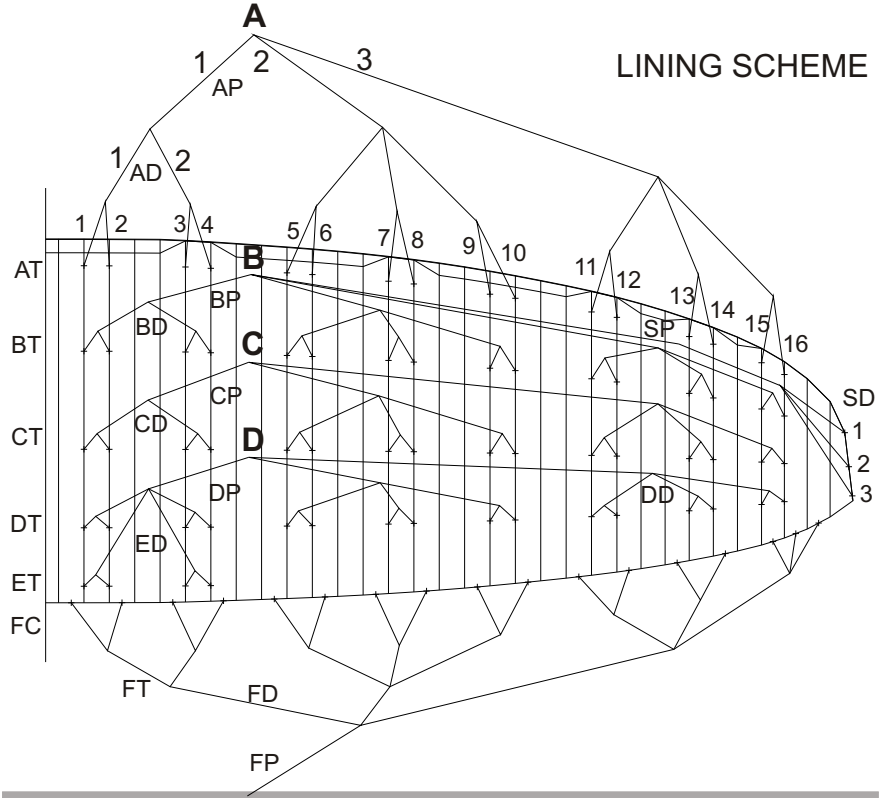
SEE YOU IN THE AIR!

8. RIGGING TABLES

Lengths are measured with a specialised, computer-operated device. All lines before cutting are stretched with a 5 kg load. Thanks to the above-mentioned device and proper procedures, the final tolerance of line lengths does not exceed 0.15%.

xP - main suspension line of x row,
xD - secondary line of x row,
xT - third level of x row (near the canopy),
EC - fourth level of steering lines (near the canopy).

CAUTION!!! Distances given below are to be understood as distances between connection points. When cutting a line for repair, 20 cm extra must be counted, as at each end a 10 cm stitch is required to fix the loop. The only exception is the main steering line (EP1), which is looped only at the upper end, while there is 20 cm left below for fastening the brake handle (this means 30 cm extra is needed).



ReAction 25

Lines	A Row			B Row			C Row				D Row			E Row		Steering lines				Stabilizer	
	AT	AD	AP	BT	BD	BP	CT	CD	CP	CP	DT	DD	DP	ET	ED	FC	FT	FD	FP	SD	SP
1	67	143	509	58	143	509	67	189		509	82	143	509	54	185	95	176	278	320	109	537
2	64	138	463	55	138	463	64	183		463	79	138	463	51	185	80	166	245		107	
3	67	185	463	58	185	463	67	244	463		82	185	463	49		79	171	227		110	
4	69	180		60	180		69	238			84	180		51		71	157				
5	72	185		63	185		72	244			87	185				94	157				
6	69	185		60	185		69	244			83	185				80	144				
7	67	176		59	176		68	232			82	176				83	138				
8	67	171		59	171		68	226			82	171				76	134				
9	66			59			67				80					72					
10	69			62			70				83					72					
11	62			56			64				75					95					
12	57			51			59				70					82					
13	53			49			56				66					71					
14	49			45			52				61					58					
15	46			43			49				57					61					
16	42			40			45				52					57					
17																57					
Type	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Diam.	1,2	1,3	1,8	1,2	1,3	1,8	1,2	1,2	1,3	1,5	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,3	2,3	1,2	1,5

ReAction 27

Lines	A Row			B Row			C Row				D Row			E Row		Steering lines				Stabilizer	
	AT	AD	AP	BT	BD	BP	CT	CD	CP	CP	DT	DD	DP	ET	ED	FC	FT	FD	FP	SD	SP
1	69	150	530	59	150	530	68	150		530	84	150	530	56	190	97	184	290	330	113	560
2	66	145	482	56	145	482	65	145		482	81	145	482	53	190	82	174	256		111	
3	69	193	482	59	193	482	68	193	482		84	193	482	51		80	179	237		114	
4	71	188		61	188		71	188			86	188		53		73	164				
5	75	193		66	193		75	193			90	193				96	164				
6	71	193		62	193		71	193			86	193				82	150				
7	70	184		61	184		71	184			85	184				86	145				
8	70	179		61	179		70	179			85	179				78	140				
9	69			61			70				83					75					
10	71			64			73				86					74					
11	65			58			67				79					99					
12	59			53			62				73					85					
13	55			50			58				68					73					
14	51			47			54				64					58					
15	47			44			51				59					63					
16	44			41			46				53					59					
17																59					
Type	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Diam.	1,2	1,3	1,8	1,2	1,3	1,8	1,2	1,2	1,3	1,5	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,3	2,3	1,2	1,5

Line sizes in [cm]. T letter means Technora lines.

ReAction 29

	A Row			B Row			C Row				D Row			E Row		Steering lines				Stabilizer	
Lines	AT	AD	AP	BT	BD	BP	CT	CD	CP	CP	DT	DD	DP	ET	ED	FC	FT	FD	FP	SD	SP
1	72	155	550	61	155	550	71	155		550	87	155	550	58	197	101	190	300	340	119	580
2	68	150	500	58	150	500	68	150		500	84	150	500	55	197	86	180	265		116	
3	72	200	500	61	200	500	71	200	500		87	200	500	53		84	185	245		119	
4	74	195		63	195		73	195			89	195		55		76	170				
5	78	200		69	200		78	200			93	200				101	170				
6	74	200		65	200		74	200			90	200				86	155				
7	73	190		64	190		73	190			89	190				89	150				
8	72	185		64	185		73	185			88	185				82	145				
9	72			64			73				87					78					
10	75			67			76				90					78					
11	68			61			70				82					104					
12	62			56			65				77					90					
13	58			54			62				72					78					
14	54			50			57				67					62					
15	50			47			54				62					65					
16	46			43			49				56					61					
17																61					
Type	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Diam.	1,2	1,3	1,8	1,2	1,3	1,8	1,2	1,2	1,3	1,5	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,3	2,3	1,2	1,5

ReAction 31

	A Row			B Row			C Row				D Row			E Row		Steering lines				Stabilizer	
Lines	AT	AD	AP	BT	BD	BP	CT	CD	CP	CP	DT	DD	DP	ET	ED	FC	FT	FD	FP	SD	SP
1	74	160	571	64	160	571	74	160		571	90	160	571	60	204	105	197	310	350	124	602
2	71	155	519	60	155	519	71	155		519	87	155	519	57	204	89	186	274		121	
3	74	207	519	63	207	519	74	207	519		90	207	519	55		88	191	254		124	
4	76	202		66	202		76	202			92	202		57		80	176				
5	81	207		71	207		81	207			97	207				105	176				
6	77	207		67	207		77	207			93	207				90	160				
7	75	197		66	197		76	197			92	197				93	155				
8	75	191		66	191		76	191			91	191				85	150				
9	75			66			76				90					81					
10	78			70			79				93					81					
11	71			64			72				85					108					
12	65			58			67				80					94					
13	60			56			64				75					80					
14	56			52			60				70					64					
15	53			50			56				65					67					
16	49			46			52				59					63					
17																63					
Type	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Diam.	1,2	1,3	1,8	1,2	1,3	1,8	1,2	1,2	1,3	1,5	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,3	2,3	1,2	1,5

Line sizes in [cm]. T letter means Technora lines.

9. RISERS: DESIGN AND ACCESSORIES

Figure 1 Hangpoint setting: A - high, B - low

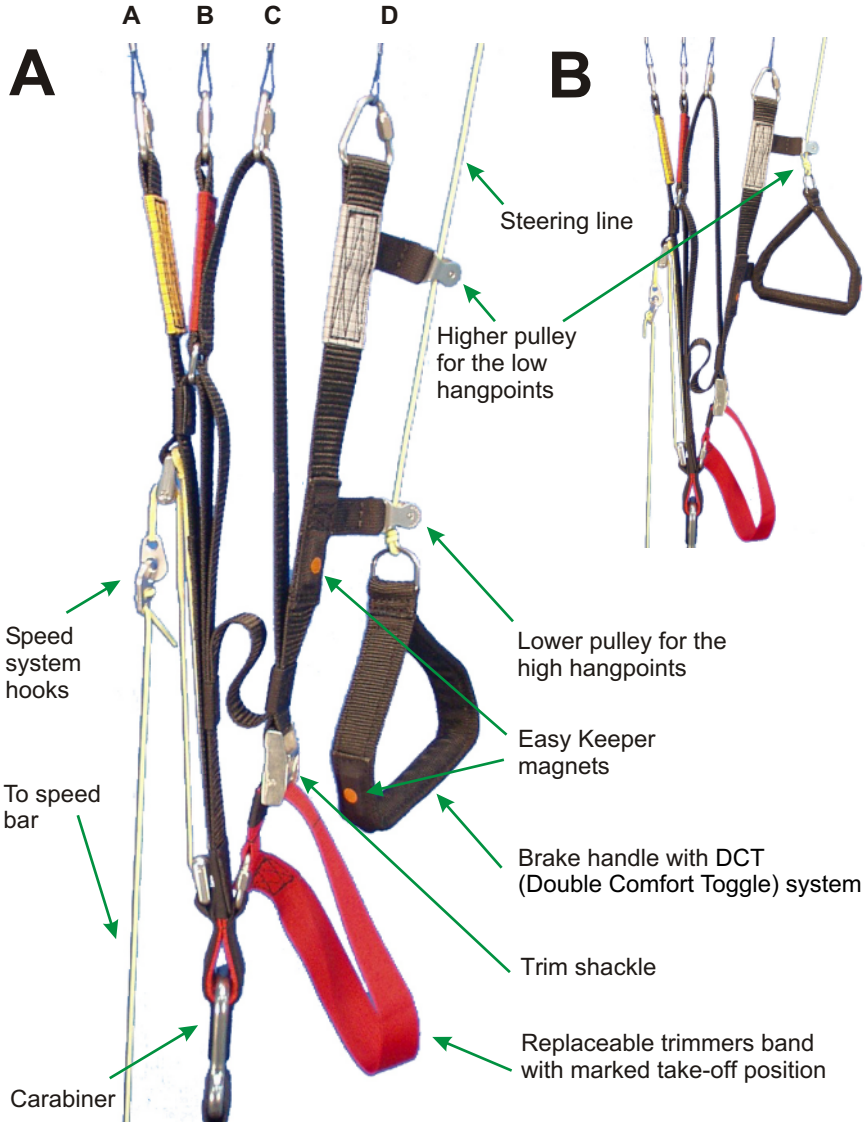


Figure 2 Influence of the trimmers on the wing profile

Trimmers closed.
Minimal speed
and minimal sink

Risers length (cm)
- neutral configuration:

A	B	C	D
45	45	45	45

Trimmers opened 30%.
Best take-off setting

Lengthening:

C	D
+2 cm	+4 cm

Trimmers fully opened.
Maximum speed

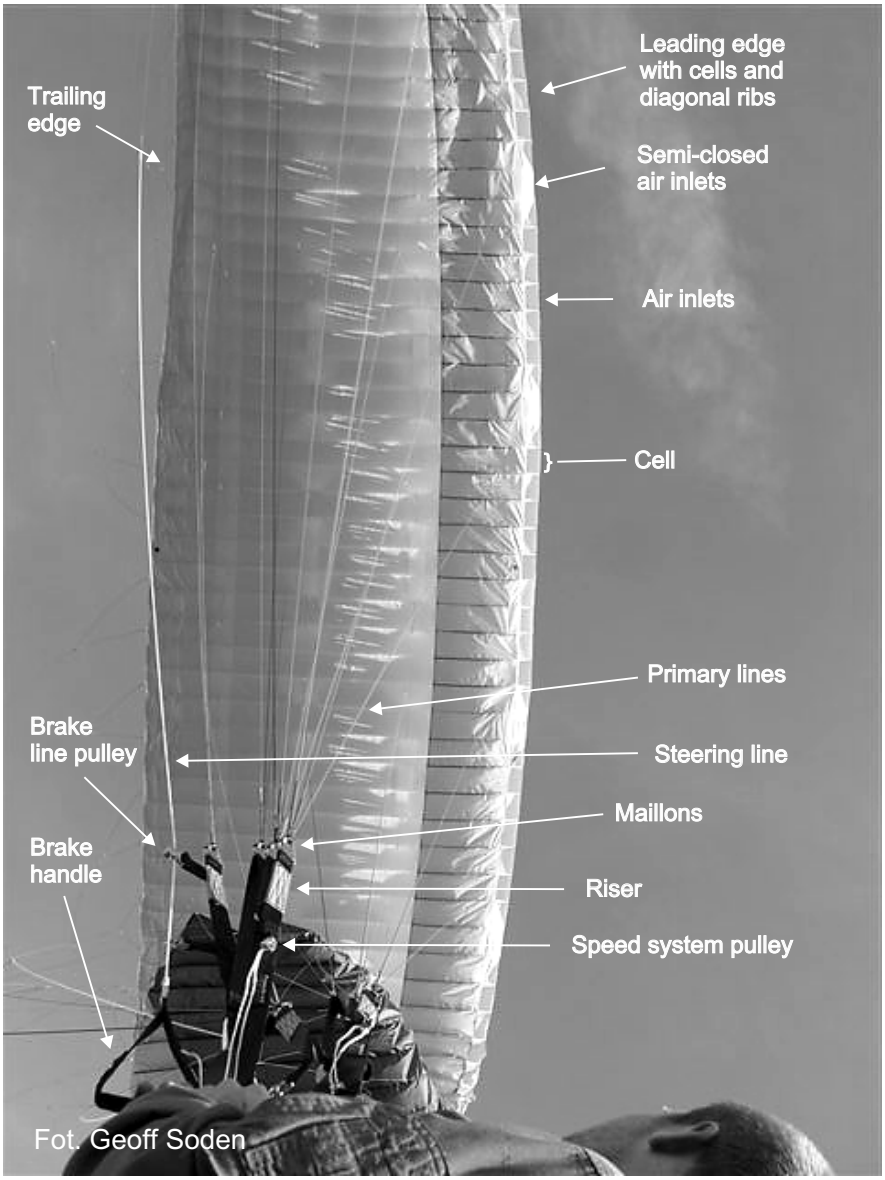
Lengthening:

C	D
+7cm	+14cm

Figure 3 Influence of the trimmer settings on speed-system action

Full acceleration with closed trimmers: good speed, easy steering, decreased stability. Classic speed-system action.

Full acceleration with opened trimmers: small attack angle, maximum speed, great stability and hard steering.


Trailing edge
Leading edge with cells and diagonal ribs
Semi-closed air inlets
Air inlets
Cell
Primary lines
Brake line pulley
Steering line
Maillons
Brake handle
Riser
Speed system pulley
Fot. Geoff Soden

V 12.2005a

Dudek Paragliding
ul. Szancera 2/XIp
85-792 Bydgoszcz
tel. +48 52 348 55 35
info@dudek.com.pl

www.dudek.com.pl